

Hypothesis Concerning the Phenomenon of Ball Lightning

11 September 2025

Simon Edwards

Research Acceleration Initiative

Introduction

The phenomenon of ball lightning has intrigued, disturbed and perplexed humanity throughout recorded history. The purpose of this publication is to explore a potential explanation for all of the documented features of ball lightning events which takes into account what we now understand about the generation of positrons and the nature of polaritons.

Abstract

There are three general types of lightning strikes: Cloud-to-Cloud, Cloud-to-Ground and Ground-to-Cloud, often abbreviated CC, CG and GC. CC-type lightning is, by far, the most common, followed by CG, followed by GC. The precise path taken by lightning is governed by the principle of path of least resistance. As electricity requires a conductive pathway, the path of least resistance for a lightning bolt is whichever pathway features the highest density of atmosphere and/or conductive particulates. This is, importantly, the opposite of the way that wind resistance against an object works in fluid dynamics wherein resistance decreases with density. What is important in this case, however, is that this path of least resistance is “predictable” insofar as *this path is the same regardless of the direction of flow of electrons*.

As a consequence of this predictable behavior, it is possible for; on rare occasion, a mass of positively electrically charged atmosphere to insert itself between negatively charged clouds and a negatively charged air mass near the surface. The result of this atmospheric condition can be that discrete Cloud-to-Ground and Ground-to-Cloud strikes could be triggered with near-simultaneity.

If electrons associated with discrete CG and GC strikes followed identical pathways predetermined by the principle of “path of least resistance,” but in opposing directions, the effect would be much the same as artificial experiments in which electrons are forced past one another from opposing directions at relativistic velocities in order to generate positrons.

If these diametrically-opposing electrical discharges produced sufficient quantities of positrons, it could be predicted that these positrons could accumulate and self-stabilize in a vortex of polaritons.

As explored in the publication of 10 September 2025, a polariton is positively charged (and therefore would attract electricity, accounting for the adherence of electrons to the “ball”) but is also an omnidirectional magnetic south emitter, meaning that it would magnetically repel electrons even as its positive charge would attract them.

A mass of polaritons which both attracts and repels electrons using two different forces (Coulomb and Magnetic, respectively,) could be predicted to have the capacity to hold flowing electrons associated with the lightning strike within an envelope surrounding the mass of polaritons for the length of time associated with eyewitness accounts of ball lightning.

In some cases, the bubble this creates can collapse inward, the inward collapse of the electron vortex resulting in an especially loud boom of thunder as a result of the collapse of the atmospheric vacuum created from the elimination of atmosphere. In other cases, ball lightning has been reported to dissipate without creating a booming sound. A potential explanation for this duality is proceeding in a subsequent paragraph.

Literature about ball lightning describes it as a "ball of plasma." This is misleading as ball lightning is an envelope of circulating electrons (which contains small amounts of plasma, granted,) which is filled with standard atmosphere rich in polaritons. By describing ball lightning as a "ball of plasma," the reader is given the impression that the entire body of the ball lightning consists of plasma. I posit that only a thin envelope near the exterior consists of plasma.

As mentioned in 10 September 2025, polaritons must maintain rotational momentum in order to continue to exude the needed "south magnetism" which repels both electrons and neutrinos (or anything negatively charged.) The duality of ball lightning dissipating either with a sudden inward collapse of the surrounding electricity or in gradual outward dissipation could be explained by the alternative cases of the polaritons either losing axis rotation over time (leading to sudden inward flux of the surrounding electrons) or the introduction of electromagnetism by countervailing currents of electrons within the envelope, leading to a gradual decrease in the net positive charge within the envelope, diminishing the overall Coulomb attraction of the interior whilst magnetic repulsion remains as a extant force acting on the electrons.

If the electrons within the envelope after ball lightning is established rotate in a uniform manner, the result is ultimately an inward collapse producing a loud boom and an abrupt discharge of electricity which is dangerous to any living creatures nearby because the attractive, positive electrical charge of the polariton vortex outlives its repulsive, magnetic ebullience. If the electrons continue to circulate in the same sort of countervailing pattern which generated the positron generation event in the first place, this could be predicted to produce large amounts of EM which turn the overall charge toward something more neutral and which cause electrons to bleed out gradually, resulting in mild introduction of static electricity to the surroundings.

To put it very simply, the ball lightning is filled with particles which both attract and repel. When the attractive force outlives the repulsive force, the ball terminates with an abrupt collapse. When the repulsive force outlives the attractive force, the result is a quiet dissipation. As I will explain, it is the latter scenario which generates the "sulfur smell" cases which are so well documented.

In many cases, a smell of sulfur has been reported wherein these balls of lightning have entered buildings or intersected with ships at sea only to leave behind a foul odor of sulfur. This smell does not come from the lightning, but must come from any sulfur-containing objects near the ball lightning, especially those made of iron insofar as iron tends to contain a certain amount of sulfur due to collocation of sulfur and iron in the Earth's crust. This sulfur is vaporized when electrical current is introduced to objects made of iron. Even objects made of wood can contain sulfur and this sulfur can smolder as a result of X-Ray bombardment, which is intense in the presence of ball lightning.

If an X-Ray detector were ever able to capture the associated X-Ray emission from ball lightning, it would find that the emissions are dangerously high and comparable to that of a Computed Axial Tomography scanner set to full power. Although all lightning produces some X-Rays, ball lightning produces *extremely intense* X-Ray radiation over a period of 10-15 seconds. The rarity of these events has precluded empirical measurement of this, but the understanding that countervailing electron currents produces EM and that the relative velocity of the electrons determines the energy level of the photonic emissions allows one to predict confidently that this is the case.

Conclusion

The mystery of ball lightning has stupefied humanity for thousands of years. It is only with our modern understanding of EM and positron emission/dynamics that this hypothesis was made possible. Importantly, the sulfur odor associated with ball lightning does not come from the combustion of sulfur within the ball lightning, but the ignition of sulfur in surrounding objects resulting from intense X-Ray bombardment. I think we can say this with confidence a lighting a sulfur match and then subsequently electrifying it does not produce ball lightning. I believe we can safely discount the possibility that the ball lightning is carrying sulfur with it brought from the clouds and that sulfur somehow has the power to trap electrons in a vortex through its innate properties.

Positron/polariton containment, as outlaid in yesterday's publication, likely has many potential applications and is a worthy avenue of research.